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06.04-7/01/01-00571

Final

Decision Document

SWMUs 2D, 18, 19, 20, and 23

NAS Oceana
Virginia Beach, Virginia

July 2001

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1.1 Site Name and Location

Solid Waste Management Units (SWMUs) 2D, 18, 19, 20, and 23
Naval Air Station (NAS) Oceana
Virginia Beach, Virginia

1.2 Statement of Basis and Purpose

This decision document (DD) presents the no CERCLA remedial action decision for SWMUs 2D, 18, 19, 20, and 23, located at NAS Oceana, Virginia Beach, Virginia. This determination has been made in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record file for this site.

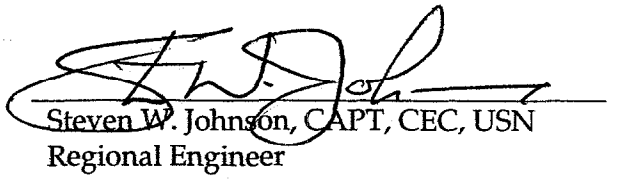
The Virginia Department of Environmental Quality (VDEQ) concurs with the selected remedy (see Appendix A).

1.3 Description of the Selected Remedy

Previous investigations of SWMUs 2D, 18, 19, 20, and 23 have determined that these sites pose no unacceptable human health or ecological risk. Therefore, no CERCLA remedial action is necessary to protect public health or the environment.

1.4 Statutory Determination

The no CERCLA remedial action decision for NAS Oceana SWMUs 2D, 18, 19, 20, and 23 is protective of human health and the environment. The levels of contamination at SWMUs 2D, 18, 19, 20, and 23 allow for unlimited site use and unrestricted exposure; therefore a 5-year review will not be required.



Steven W. Johnson, CAPT, CEC, USN
Regional Engineer
By direction of the Commander,
Navy Region, Mid-Atlantic

6/28/01
Date

2.0 Decision Summary

This DD is issued to describe the Department of the Navy (Navy) and U.S. Environmental Protection Agency's (EPA's) selected remedial action for SWMUs 2D, 18, 19, 20, and 23 at NAS Oceana, Virginia Beach, Virginia (Figure 2-1). The Virginia Department of Environmental Quality (VDEQ) concurs with the selected remedy. The Navy is the lead agency and provides funding for site cleanups. SWMUS 2D, 18, 19, 20, and 23 (Figures 2-2 through 2-7) are among several Installation Restoration Program (IRP) sites located at the NAS Oceana facility.

2.1 Site Name, Location, and Description

The site name is NAS Oceana, located in Virginia Beach, Virginia. NAS Oceana was established in 1940 as a small auxiliary airfield and has grown more than 16 times its original size to a 6,000-acre master jet base supporting a community of more than 9,100 Navy personnel and 11,000 dependents. The primary mission of NAS Oceana is to provide the personnel, operations, maintenance, and training facilities to ensure that fighter and attack squadrons on aircraft carriers of the U.S. Atlantic Fleet are deployment ready.

2.2 Site History and Enforcement Activities

2.2.1 History of Site Activities

SWMU 2D — Line Shack 125 Disposal Area

SWMU 2D encompasses Line Shack 125 and the surrounding area. Line Shack 125 was constructed in 1963 and has been used for aircraft cleaning and maintenance along with equipment and material storage. SWMU 2D extends north-northwestward from the area surrounding Line Shack 125 to Hanger 111. The area of investigation is both inside and outside the flight line fence. Potential contaminants that may have been released from 1963 until the early 1980s include oil, hydraulic fluid, and aromatic hydrocarbons used for lubrication, paint stripping, and grease removal of aircraft parts.

SWMU 18 — Hazardous Waste Storage Area, Building 200

SWMU 18 is located adjacent to Building 200, the flight line, and B Avenue. This SWMU is currently used to store hazardous waste in self-contained, walk-in lockers equipped with spill control. Under the current hazardous waste management program, wastes are stored for a period of less than 90 days. In the past, SWMU 18 consisted of two hazardous waste accumulation areas. The older storage shed possessed no release controls. The newer hazardous waste storage shed began operations in 1981 when Public Works initiated the hazardous waste pick-up program. This accumulation area was approximately 15 by 25 feet, and stored fewer than 10 drums. The walls, roof, and entrance way of the accumulation area were secured by a chain-link fence. Fifty-five-gallon drums rested on a raised concrete slab floor. Materials typically stored in the shed included double-bagged empty oil and paint

cans; double-bagged oily rags; and drums of oil, paint thinner, paint remover, jet fuel, solvents, asbestos, hydraulic fluid, freon, neutralized battery acid, and electric coolant oil.

SWMU 19 — Waste Oil Storage Area, Building 541

SWMU 19 is a 50 to 100 square foot area adjacent to the Navy Exchange Gas Station where waste oil, solvents, and transmission, brake, and hydraulic fluids generated by automobile repair and maintenance were stored in 55-gallon steel drums. During the visual site inspection (VSI) completed as part of the RCRA Facility Assessment (RFA), inspectors noted soil staining and dead grass in this area. During the VSI, only one drum was observed and there were no release-control mechanisms in place.

SWMU 20 — Waste Oil Storage Area, Building 543

SWMU 20 is a small area adjacent to the auto hobby shop (a self-help automotive garage where Navy personnel can work on their cars when off duty) where waste motor oil, hydraulic fluid, automatic transmission fluid, and other solvents were stored in 55-gallon drums.

SWMU 23 — Bowser, Building 830

SWMU 23 is the storage area of a bowser used to collect waste motor oil drained from the heavy and light equipment of the Public Works fleet. The area is located adjacent to Building 830, which has housed the Public Work's Transportation Division since 1954. Waste oil was pumped into the 500-gallon bowser, which was parked on the paved parking area, and when the bowser was full, it was towed to the fuel division storage yard to transfer the waste oil into storage tanks.

2.2.2 Previous Investigations

Multiple studies within the Resource Conservation and Recovery Act (RCRA) corrective action process and studies under the IRP prior to the RCRA corrective action have been conducted at NAS Oceana. Several SWMU-specific studies are currently proposed. The studies for SWMUs 2D, 18, 19, 20, and 23 are briefly summarized below.

- *Initial Assessment Study (IAS), NAS Oceana, Virginia Beach, Virginia,* Final Document, 1984.

  The IAS was the first stage of the IRP at NAS Oceana. The IAS recommended field investigations for six SWMUs to confirm whether hazardous constituents had been released to the environment.

- *Interim RCRA Facility Investigation (RFI), NAS Oceana, Virginia Beach, Virginia,* Final Document, 1990.

  Prior to the initiation of a full-scale RFI, CH2M HILL conducted an Interim RFI. The RFI continued the investigation of six SWMUs that were originally studied under the Navy's IRP, and initiated work at four other SWMUs. The field activities were oriented towards guiding a decision on whether a given SWMU should be included for study under the RFI. The Interim RFI recommended additional work at 6 of 10 SWMUs studied; no further investigation was recommended for the remaining 4 SWMUs.

- *RCRA Facility Investigation – Phase I, NAS Oceana, Virginia Beach, Virginia,* Final Report, 1993.

  Seventeen SWMUs, including SWMUs 2D, 18, 19, 20, and 23 were investigated during the Phase I RFI. As a result of this investigation, SWMUs were reclassified into four categories: (1) SWMUs that could advance to a Corrective Measures Study (CMS); (2) SWMUs that required additional characterization under a second phase of the RFI; (3) SWMUs where contamination, specifically of soil, could be remediated immediately on the basis of the existing data; and (4) SWMUs requiring no additional study or remediation. The SWMUs were divided into separate study tracks based on these recommendations.

- *Phase II RCRA Facility Investigation of SWMUs 2D, 2E, 15, 24, and 25, NAS Oceana, Virginia Beach, Virginia,* Draft Final Report, 1995

  A Phase II RFI was conducted for 5 of the 17 SWMUs (SWMUs 2D, 2E, 15, 24, and 25) that required additional characterization. This work is described in the draft final Phase II RFI report of February 1995.

- *Corrective Measure Studies for Petroleum Contaminated SWMUs (POL CMS), NAS Oceana, Virginia Beach, Virginia,* Final Report, 1995 and *Excavation, Transportation and Disposal of Petroleum Contaminated Soils (ETD PCS), NAS Oceana, Virginia Beach, Virginia,* Final Document, 1995.

  A CMS was conducted for five SWMUs (SWMUs 11, 18, 19, 20, and 24), which had soil contaminated with petroleum–oil lubricant (POL) wastes. The POL CMS and ETD PCS describe the sampling conducted to delineate specific areas of contamination and the interim cleanup action to address these areas of contaminated soils.

- *Phase III RFI, NAS Oceana, Virginia Beach, Virginia,* Final Document, 1999.

  Data gaps identified in the RFI Phase I, RFI Phase II, the POL CMS, and the ETD PCS were used to scope the field work for the Phase III RFI. The initial Phase III RFI field investigation focused on nine SWMUs (1, 2B, 2D, 18, 21, 24, 25, and 26 and was completed in December 1997. A draft-final report was submitted to the EPA for review and comment in July 1998. Due to regulatory comments on the draft-final report, additional fieldwork was required.

- *Screening Ecological Risk Assessment (SERA), SWMUs 2C, 2D, 2E, 18, 19, 20, 23, and 24, NAS Oceana, Virginia Beach, Virginia,* Final Document, 1999.

  The Navy prepared a SERA for eight SWMUs, including 2D, 18, 19, 20, and 23. The SERA proposed no further action (NFA) for ecological concerns at these eight SWMUs due to lack of complete exposure pathways.

  The Navy's response to comments on the Phase I RFI, the Phase II RFI, the POL CMS, the ETD PCS report, and the findings of the Phase III RFI support the determination of NFA at 11 of the SWMUs, including 2D, 18, 19, 20, and 23. The NFA determination was

based primarily upon human health risk considerations. It was agreed that the EPA's Biological Technical Assistance Group (BTAG) would forgo a review of previous RCRA reports and the Phase III RFI as the Navy further evaluated ecological concerns at all NAS Oceana SWMUs within the ecological risk assessment (ERA) process required under CERCLA.

Previous investigation reports are included in the Administrative Record for this site.

2.2.3 Enforcement Actions

The investigation/remediation is a joint effort among the Navy, EPA, VDEQ, and the Activity. Previous SWMU investigations have been conducted under provisions of the RCRA Corrective Action program. As of July 1998, cleanup activities are being conducted under the provisions of CERCLA of 1980, within the framework of new administrative procedures. Under the new administrative procedures, the Navy and EPA will reach concurrence on the classification of each SWMU in lieu of scoring each SWMU for the National Priorities List (NPL).

A total of 60 SWMUs were recommended for study in the draft RCRA Consent Order issued by the EPA. After reviewing the results of the Interim RCRA Facility Investigation (RFI), the Navy and EPA determined that only 19 SWMUs required investigation under the RCRA Consent Order; the remainder of the SWMUs are regulated under other federal and/or state programs. Following the issuance of the RCRA Consent Order, the Navy combined four of the identified SWMUs into two due to relative proximity and similar site operations; therefore, the final count of sites investigated by the Navy in the previous investigation is 17 SWMUs.

2.3 Community Participation

In accordance with Sections 113 and 117 of CERCLA, the Navy provided a public comment period from January 7, 2001 through February 6, 2001 for the proposed remedial action.

The PRAP was available to the public in the Administrative Record and in an information repository maintained at the Virginia Beach Public Library, 4100 Virginia Beach Boulevard Virginia Beach, Virginia. Public notice was provided in *The Virginia Pilot* on January 7, 2001 and a public meeting was held in the NAS Oceana Officers Club, NAS Oceana, Virginia Beach, Virginia on January 30, 2001.

The Navy and NAS Oceana have had a comprehensive public involvement program for several years. Starting in January 1989, a Technical Review Committee (TRC) met on average twice a year to discuss issues related to investigative activities at NAS Oceana. The TRC was composed of mostly governmental personnel; however, a few private citizens attended the meetings.

In November 1994, the Navy converted the TRC into a Restoration Advisory Board (RAB). The RAB is co-chaired by a community member and has held meetings approximately every 4 to 6 months. Previous investigations were discussed at the RAB meetings.

Community participation activities for the final selected remedy include:

- The documents concerning the investigation and analysis at SWMUs 2D, 18, 19, 20 and 23 were placed in the information repository at the Virginia Beach Public Library, 4100 Virginia Beach Boulevard Virginia Beach, Virginia.
- A newspaper announcement on the availability of the documents and the public comment period/meeting date was placed in *The Virginia Pilot* on January 7, 2001.
- The Navy established a 30-day public comment period starting January 7, 2001 and ending February 6, 2001 for review of the PRAP.
- A Public Meeting was held January 30, 2001 to answer any questions concerning the PRAP. The transcript of this Public Meeting is included in the Responsiveness Summary, which is part of this Decision Document.

2.4 Scope and Role of Response Actions

Under the new administrative procedure, conducting all clean-up activities following the procedural and substantive requirements of CERCLA while the RCRA Consent Order remains in effect, the Navy issued a Site Management Plan (SMP) to present an overall site clean-up plan for NAS Oceana. The SMP divided the 17 NAS Oceana SWMUs into four categories based upon the additional work required for each SWMU.

- Category 1 – SWMUs that Require no Further Study, Remediation, or Risk Assessment (2D, 18, 19, 20, 23); these SWMUs are the subject of this DD
- Category 2 – SWMUs that Require no Further Study or Remediation, but Require Further Consideration for Ecological Risk (11, 16/16GC, 21, 22, 25, 26)
- Category 3 – SWMUs that Currently Require Additional Study or Remediation but do not Require Further Consideration for Ecological Risk (2C, 2E, 24)
- Category 4 – SWMUs that Currently Require Additional Corrective Action under CERCLA and Require Further Consideration for Ecological Risk (1, 2B, 15)

In addition to the investigations, which are summarized in Section 2.2.2, the Navy is nearing completion of the ERA for SWMUs 1, 2B, 11, 16/16GC, 21, 22, 25, and 26. Further, the Navy is proceeding with a human health risk assessment (HHRA) at SWMUs 1, 2B, 2C, 2E, 15, and 24. Following the completion of these ERAs and HHRAs, a feasibility study (FS) is planned for those SWMUs warranting additional CERCLA action to determine potential remedial alternatives. A Proposed Remedial Action Plan (PRAP) and DD will be prepared for each NAS Oceana SWMU to document the selected remedial alternatives. This DD for SWMUs 2D, 18, 19, 20, and 23 is the first to be completed at NAS Oceana and addresses the Category 1 SWMUs.

2.4.1 Past Removal Actions

A CMS was conducted for five SWMUs (SWMUs 11, 18,19, 20, and 24) identified in the RFI-Phase I that had soil contaminated with POL wastes. The POL CMS recommended soil removal actions be implemented at each of the five SWMUs investigated. The ETD PCS

report provides detailed information pertaining to the excavation of the soils at these five sites. The following sections summarize the soil removal actions completed for the SWMUs specific to this DD, SWMUs 18, 19, and 20.

SWMU 18

The POL CMS recommended that the soil in excess of the VDEQ storage tank guidance notification standard of 100 mg/Kg of TPH be excavated from the two storage shed areas; this cleanup goal is not driven by risk. The removal action consisted of two separate excavation areas. Based upon confirmatory sampling conducted during the excavations, the cleanup goal was achieved at the side-wall and bottom sampling locations, with the exception of excavation soil sampling locations that were directly adjacent to existing building foundations or under existing tarmac concrete. At those locations contaminated soil was left in place. The excavations were backfilled and paved with asphalt following the removal action. Results of the soil removal action are documented in the 1995 Excavation, Transportation and Disposal of Petroleum Contaminated Soils report. Additional confirmatory sampling at SWMU 18 was requested by EPA during the review of the POL-CMS and the ETD PCS report; this sampling and assessment of associated risk was included in the Phase III RFI.

SWMU 19

The POL CMS recommended that the soil in excess of the VDEQ storage tank guidance notification standard of 100 mg/Kg of TPH be excavated from a defined area to a depth of four feet; this cleanup goal is not driven by risk. The removal action consisted of a 10-foot long by 10-foot wide section, excavated to a depth of 4 feet. Based upon confirmatory sampling conducted during the excavation, the cleanup goal was achieved at the excavation. This area was backfilled and seeded with grass following the removal action.

SWMU 20

The POL CMS recommended that the soil in excess of the VDEQ storage tank guidance notification standard of 100 mg/Kg of TPH be excavated from a defined area to a depth of three feet; this cleanup goal is not driven by risk. Groundwater was sampled in the area with the greatest soil contamination and analyzed for TPH, VOCs, PAHs, and metals. All detections were below MCLs and tap water RBCs so no further action for groundwater was required based on human health considerations. As a follow-on to the POL CMS a soil removal action was implemented. The removal action consisted of a 31 x 24 foot area excavated to a depth of 3 feet. Seven confirmatory samples were well below the cleanup goal of 100 mg/kg for TPH. Following the removal action, the excavation was backfilled and seeded with grass.

2.5 Site Characteristics

2.5.1 Overview

Site Topography

The elevation of NAS Oceana ranges from approximately 5 feet above mean sea level (msl) in the drainage ditches to approximately 25 feet above msl in the open fields. Elevations in

the developed area of the station range from 10 to 25 feet above msl. Topography of the station is generally flat with a gradual easterly slope to the land surface.

Surface Water Hydrology

Surface runoff from the station is facilitated by a system of drainage ditches and surface canals that flow southwest to West Neck Creek, north to London Bridge and Great Neck Creek, and east to Owls Creek and Lake Rudee. Early field investigations noted the presence of iron precipitate, organic odors, high turbidity, and thick brown algae mats in many ditches.

Geology/Hydrogeology

NAS Oceana is on the outer edge of the Atlantic Coastal Plain physiographic province. The Atlantic Coastal Plain is a broad wedge of unconsolidated sediments that dip and thicken to the east. In the vicinity of NAS Oceana, the sediments consist of several thousand feet of unconsolidated sand, clay, silt, and gravel that are underlain by granite basement rock. The sediments range in age from early Cretaceous to Recent. From oldest to youngest, the four geologic units underlying NAS Oceana are (1) the Potomac Formation, (2) the Pamunkey Group, (3) the Chesapeake Group, and (4) the Columbia Group. The geologic units of concern in the environmental investigations at NAS Oceana are in the Chesapeake Group (only the youngest unit, the Yorktown Formation) and the Columbia Group.

The Chesapeake Group has been differentiated into several units, which are, from oldest to youngest, the Calvert, Choptank, St. Mary's, Eastover, and Yorktown Formation. As mentioned above, only the Yorktown Formation is of potential concern at NAS Oceana. The Yorktown Formation consists of interbedded layers of shelly, very fine to coarse sands, clayey sands, and sandy clay. The Yorktown Formation is divided into three sand units, each overlain by a confining layer of silt and clay. Regionally, the uppermost of these silt and clay beds, which is referred to as the Yorktown confining unit, separates the Yorktown Formation from the sediments of the Columbia Group that overlie it. This uppermost bed consists of massive, well-bedded yellow-gray to greenish-gray clays and silty clays, which commonly contain shells, fine sand, and mica. The clay layers within the confining bed are generally extensive but are a series of coalescing clay beds rather than a single deposited unit. This unit was deposited in a shallow open-marine environment of broad lagoons and quiet bays. The Yorktown confining unit has not been encountered while drilling at NAS Oceana.

The sediments of the Columbia Group consist of interbedded gravel, sands, silts, and clays of Pleistocene and Holocene age. The Pleistocene and Holocene sediments were deposited in fluvial-marine terrace and near-shore marine environments, including lagoons, beaches, tidal flats, and barrier islands. The Columbia Group sediments are, from oldest to youngest; (1) the Great Bridge Formation; (2) the Norfolk Formation; (3) the London Bridge Formation; and (4) the Sand Bridge Formation.

The Sand Bridge Formation consists of a pale, yellowish-brown silt to sandy silt, often characterized as being clayey. This formation extends from the surface to a depth of 3 to 6 feet. Underlying the Sand Bridge Formation is the London Bridge Formation, a bluish-gray, fine silty sand, which is generally 4 to 5 feet thick. The third member of the Columbia Group is the Norfolk Formation. This formation, which is approximately 8 to 11 feet thick, is

a bluish-gray to gray, fine to medium sand with trace shell fragments. The Great Bridge Formation underlies the Norfolk. The Great Bridge has an upper and lower member. The upper member is a white to light gray, well-graded sand. The lower member exhibits similar grain sizes and colors, but contains minor amounts of pebble gravel and bluish shell fragments. The Great Bridge Formation ranges in thickness from 0 to 55 feet.

Groundwater at NAS Oceana is generally within 4 to 10 feet of the ground surface. Aquifer conditions are unconfined in the Columbia Group and unconfined to semiconfined within the upper Yorktown Formation. When the clay confining unit overlying the Yorktown is absent, the upper Yorktown is generally unconfined. Natural groundwater flow directions are generally south to southeast, but flow direction is controlled locally in the Columbia Group by drainage ditches. The flow direction in the Virginia Beach area is, therefore, highly variable because of the complexity of the drainage patterns.

There are seven wells on the base that extract groundwater from the subsurface. Two of the seven wells (designated WS-5 and WS-7) extract groundwater from the Columbia Aquifer. The others extract water from the underlying Yorktown Aquifer. Of the two wells in the Columbia Aquifer, one supplies water to a maintenance sink. The other well supplies a guard house bathroom. Both are posted as, "Not for drinking water."

2.5.2 SWMU — Specific Site Characteristics

SWMU 2D — Line Shack 125 Disposal Area

The SWMU is entirely covered with asphalt and concrete. The topography slopes slightly to the west toward the wooded area, which is situated off the flight line. Water resources in this area are limited to a short ditch, which occurs in the southwestern corner of the wooded area, that directs stormwater to the southwest. With the exception of the wooded area, lawn grasses occur over most of the unpaved portion around the SWMU. The overstory in a small wooded area southwest of the SWMU is sparse and is dominated by sweetgum, southern red oak, and red maple. The understory is dominated by greenbriar, giant cane, and Japanese honeysuckle. The wooded area provides suitable habitat for roosting and nesting birds that are adapted to living in developed areas.

SWMU 18 — Hazardous Waste Storage Area, Building 200

Ground cover consists mostly of concrete and asphalt parking lots, driveways, and roadways. A thin strip of maintained grass bounds the southeastern portion of the SWMU. Two species of trees were identified in this area: blackjack oak and sweetgum. Other vegetation in the study area includes lawn grasses and unidentified cultivated shrubs. No species of birds or other wildlife were observed. No wetland habitat exists at the SWMU.

SWMU 19 — Waste Oil Storage Area, Building 541

The area within and around SWMU 19 is flat and includes both developed and undeveloped land. The developed portion of this study area is covered with concrete and asphalt parking lots, access road, and storage areas. The undeveloped area is comprised of a forested area, dominated by loblolly pine that includes a recreational park with a jogging trail and picnic facilities. A 50-foot-wide grassy lawn separates the forested area from SWMU 19. The soils in the area are poorly drained and classified as Acredale-Urban. Most

of the study area is made up of a mosaic of small wetland patches mixed with larger areas of upland. Much of the forested area has intermittent saturated soils.

SWMU 20 — Waste Oil Storage Area, Building 543

SWMU 20 is flat with developed asphalt and concrete areas, maintained lawn, and an adjacent forested area. SWMUs 19 and 20 are adjacent to each other and their environmental setting is the same.

SWMU 23 — Bowser, Building 830

SWMU 23 is located adjacent to Building 830 and is surrounded by a large, flat asphalt parking lot. The land adjacent to the parking lot is vegetated by scrub-shrub, a forested area, and a picnic ground with maintained lawn and several trees. The soil underlying the area is a silty loam that is poorly drained.

2.5.3 Description of Contamination

SWMU 2D, Line Shack 125 Disposal Area

SWMU 2D was investigated five times. The first investigation was the IAS, which was followed by the Interim RFI. Subsequent investigations included the Phase I RFI, Phase II RFI, and Phase III RFI.

IAS - The IAS identified SWMU 2D as an area where waste chemicals from aircraft cleaning and maintenance activities were disposed. The IAS also reported that waste liquids were formerly disposed in low areas behind Line Shack 125. During construction of a new concrete pad for the Line Shack 125 in the early 1980s, the soil beneath Line Shack 125 was found to be saturated with oily substances to a depth of approximately 6 feet. The oil-saturated soil was excavated and a new concrete pad was poured.

Interim RFI - The Interim RFI activities at SWMU 2D in 1990 indicated that a monitoring well at the SWMU had detectable amounts of 1,1-dichloroethene (1,1-DCE). The results from the Interim RFI were insufficient to support the installation of additional wells or to initiate soil sampling in an effort to identify the potential source of the contaminant in one well.

Phase I RFI - The Phase I RFI at Site 2D involved the collection of a second round of groundwater samples to determine if further investigation was required. The Phase I RFI concluded that 1,1-DCE groundwater contamination is limited to the vicinity of well 2D-MW2.

Phase II RFI - The Phase II RFI involved monitoring well installation, groundwater sampling, and subsurface soil sampling to further define the source and distribution of 1,1-DCE. The Phase II RFI concluded that 1,1-DCE groundwater contamination is limited to the vicinity of one monitoring well in the center of the SWMU as was determined during the Phase I RFI. No 1,1-DCE was detected in the soil at the SWMU. Therefore, the Phase II RFI concluded that the soil required no further action.

Phase III RFI - The Phase III RFI involved groundwater sampling from monitoring wells. 1,1-DCE, benzene, and vinyl chloride were detected in the groundwater sample collected from one monitoring well located at the center of the SWMU. Benzene and trace fuel constituents were detected in another monitoring well. The Phase III RFI groundwater

analytical results were compared to the EPA Maximum Contaminant Levels (MCLs) for drinking water, Virginia Groundwater Standards, and EPA Region III Risk Based Concentrations (RBCs) for tap water. All concentrations of detected compounds were below the EPA MCLs and Virginia groundwater standards. However, exceedances of RBCs were encountered, as discussed in the risk assessment subsection.

A comparison of the Phase III analytical results with those from previous investigations shows a decrease in the 1,1-DCE concentration. Vinyl chloride, the most common degradation product of 1,1-DCE, was detected in the monitoring well that historically contained 1,1-DCE. Historically, vinyl chloride had not been detected in any groundwater samples collected at SWMU 2D.

SWMU 18 — Hazardous Waste Storage Area, Building 200

According to the RFA conducted in 1988, soil staining around this hazardous waste storage shed was observed during the VSI. For this reason, SWMU 18 was included in the Phase I RFI. Subsequent investigations include the POL CMS, the ETD PCS, and the Phase III RFI.

Phase I RFI - The Phase I RFI characterized the soils around the storage sheds to determine if contamination had occurred. Surface soil samples were collected near the storage areas and analyzed for "Appendix IX parameters" (volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, pesticides, herbicides, PCBs, dioxin, and furans). The analytical laboratory results of soil sampling indicated that the surface soil is locally contaminated with constituents of oil and fuels consisting of TPH and polynuclear aromatic hydrocarbons (PAHs).

POL CMS - The POL CMS further characterized the groundwater and soil around the storage sheds to determine appropriate corrective measures. Groundwater was sampled and analyzed for TPH, PAHs and metals. In the groundwater, no TPH was detected, and concentrations of PAH and metals were below their respective MCLs and tap water RBCs. Additional soil samples were collected and analyzed for Appendix IX parameters, PAHs, and TPH. Some soil samples had elevated TPH and PAH concentrations, confirming the Phase I findings. In one out of two locations, the TPH concentration exceeded 100 mg/Kg, the VDEQ storage tank guidance notification standard. In addition, one soil sample also contained PCBs at concentrations exceeding the RCRA action level. The POL CMS recommended that the soil in excess of the VDEQ storage tank guidance notification standard of 100 mg/Kg of TPH be excavated from the two storage shed areas; this cleanup goal is not driven by risk.

As a follow-on to the POL CMS a soil removal action was implemented; VDEQ and EPA agreed to the 100 mg/Kg cleanup goal for TPH in soils recommended in the POL CMS. The removal action consisted of two separate excavation areas. Based upon confirmatory sampling conducted during the excavations, the cleanup goal was achieved at the side-wall and bottom sampling locations, with the exception of excavation soil sampling locations that were directly adjacent to existing building foundations or under existing tarmac concrete. At those locations contaminated soil was left in place. The excavations were backfilled and paved with asphalt following the removal action. Results of the soil removal action are documented in the 1995 Excavation, Transportation and Disposal of Petroleum Contaminated Soils report.

Additional confirmatory sampling at SWMU 18 was requested by EPA during the review of the POL CMS and the removal action closeout report; this sampling was included in the Phase III RFI.

Phase III RFI - The Phase III RFI documents the results of post-excavation confirmatory subsurface soil sampling around the perimeter of the excavation area where some contaminated soil was left in place, to confirm that site soil does not pose an unacceptable risk to human health. Five subsurface confirmatory soil samples were collected around the perimeter of the excavation area. Because human health risk-based soil screening values do not exist for TPH, the Phase III RFI samples were analyzed for VOCs, SVOCs, and low-concentration PAHs to determine if the remaining TPH contamination presented an unacceptable risk to human health. The PAHs and VOC confirmatory Phase III sampling results were compared to EPA Region III risk-based concentrations for the ingestion of residential soil; there were no exceedances of RBCs.

Groundwater was sampled at the SWMU and analyzed for VOCs, SVOCs, and PAHs and the results were compared to EPA Region III risk-based concentrations for tap water. The VOC, SVOC, and low-concentration PAH results indicated that no detections exceeded EPA RBCs for tap water, MCLs, or Virginia Groundwater Standards.

The RFI report concluded that the removal action was successful due to the low levels of contaminants detected. The RFI report recommended no further action for human health at this SWMU.

SWMU 19 — Waste Oil Storage Area, Building 541

Waste oil drums were observed during the RFA, conducted in 1988. Therefore, SWMU 19 was included in the Phase I RFI.

Phase I RFI - The Phase I RFI characterized the soils at the SWMU to determine if contamination had occurred. Soil samples were taken and submitted for VOC, PAH, total lead, and total petroleum hydrocarbons (TPH) analyses.

POL CMS - The POL CMS further characterized the soil within the SWMU area to determine appropriate corrective measures. Additional soil samples were collected and analyzed for TPH. Some soil samples had low TPH concentrations, confirming the Phase I findings. Groundwater was also sampled and analyzed TPH, VOCs, and PAHs. The groundwater contained no exceedances of MCLs. The POL CMS recommended that the soil in excess of the VDEQ storage tank guidance notification standard of 100 mg/Kg of TPH be excavated from a defined area to a depth of four feet; this cleanup goal is not driven by risk.

As a follow-on to the POL CMS a soil removal action was implemented. The removal action consisted of a 10-foot long by 10-foot wide section, excavated to a depth of 4 feet. The VDEQ and EPA agreed to a 100 mg/Kg cleanup goal for TPH in soil. Based upon confirmatory sampling conducted during the excavation, the cleanup goal was achieved at the excavation. This area was backfilled and seeded with grass following the removal action.

SWMU 20 —Waste Oil Storage Area, Building 543

During the visual site inspection for the RFA, soil staining, two 55-gallon steel drums, and dead grass were observed on a grassy strip adjacent to the auto hobby shop. Waste oil and other waste automobile fluids are stored in this area prompting its inclusion in the RFI.

Pre-RFI Sampling - The Navy collected soil samples in the grassy area in July 1992 and analyzed them for Benzene Tolune Ethylbenzene Xylene (BTEX) compounds, TPH, and Toxicity Characteristic Leaching Procedure (TCLP) lead. One sample contained elevated concentrations of TPH. Some soil was excavated because of these results. Additional samples were collected in September 1992, to test for residual contamination. Low levels of TPH were detected.

Phase I RFI - The purpose of the RFI was to characterize the soils in the grassy storage area. Soil samples were collected and analyzed for VOCs, PAHs, TPH, and total lead. Elevated concentrations of some VOCs, PAHs, TPH, and total lead were detected. Therefore, the RFI recommended further investigation of TPH contamination in the soil and the excavation of the contaminated soils. Groundwater sampling was also recommended.

POL CMS - The POL CMS further characterized the soil within the SWMU area to determine appropriate corrective measures. Soil samples were collected and analyzed for TPH. The study confirmed that TPH was present in the soils and determined the area of contamination. The POL CMS recommended that the soil in excess of the VDEQ storage tank guidance notification standard of 100 mg/Kg of TPH be excavated from a defined area to a depth of three feet; this cleanup goal is not driven by risk. Groundwater was sampled in the area with the greatest soil contamination and analyzed for TPH, VOCs, PAHs, and metals. All detections were below MCLs and tap water RBCs so no further action for groundwater was required based on human health considerations.

As a follow-on to the POL CMS a soil removal action was implemented. The removal action consisted of a 31 x 24 foot area excavated to a depth of 3 feet. Seven confirmatory samples were well below the cleanup goal of 100 mg/kg for TPH. Following the removal action, the excavation was backfilled and seeded with grass.

SWMU 23 —Bowser, Building 830

During the VSI, waste oil was visible on the pavement below the waste oil bowser. The bowsers are no longer used and were not present at the time of RFI sampling activities.

Phase I RFI - The purpose of the RFI site activities was to characterize the soil in the area where the bowser was parked. Surface soil samples were collected from fill material under the asphalt where the bowser was parked and analyzed for VOCs, PAHs, TPH, and total metals. The Phase I RFI revealed that the soil samples contained no VOCs or PAHs. Low concentrations of TPH (21 and 63 mg/Kg) and some heavy metals were detected in the soil samples.

2.6 Current and Potential Future Site and Resource Uses

NAS Oceana consists of approximately 6,000 acres within the City of Virginia Beach. NAS Oceana is located in the Tidewater region of Virginia and lies southeast of the City of Norfolk, immediately west of the Atlantic Ocean, and just south of the Chesapeake Bay.

More than 40 percent of the base is urbanized, including commercial, residential, and operations buildings; and runways, hangars, and similar structures. The base's undeveloped areas consist of farmland, open land, forest, and wetlands. Farmland, which comprises approximately 925 acres, is farmed by private producers under the Navy's agricultural outlease program. Major crops grown within the boundaries of the base are corn, soybeans, and winter wheat. Approximately 200 acres of open fields and meadows, and 600 acres of forest occur on NAS Oceana. The base's forested areas are dominated by pine, mixed pine-hardwood, and hardwood stands.

Wetlands comprise approximately 660 acres of the undeveloped areas. The U.S. Fish and Wildlife Service's (USFWS's) National Wetland Inventory (NWI) map classifies wetlands as palustrine emergent, palustrine scrub/shrub, and palustrine forested. However, onsite observations by a CH2M HILL ecologist during a 1992 site visit suggest that the NWI maps may underestimate the amount of forested wetlands on the base.

2.7 Summary of Site Risks

A brief summary of the relevant portions of the human health and ecological risk assessments for each SWMU is presented in this section. These assessments provide the basis for the necessary action for each SWMU.

2.7.1 SWMU 2D — Line Shack 125 Disposal Area

Groundwater at SWMU 2D was subjected to a human health risk assessment. The SWMU as a whole was evaluated for ecological risk. Results are summarized below.

Human Health Risk Assessment

The Phase III RFI groundwater maximum detected concentrations were compared to EPA Region III RBCs for tap water to determine COPCs. Three organic chemicals had maximum concentrations that exceeded the tap water RBCs and were subsequently retained as COPCs for a quantitative evaluation of risk. Table 2-1 presents the chemicals that exceeded the RBCs, the regulatory criteria, the frequency of exceedance, the location of the exceedance, the analytical results, any data validation qualifiers, the detection limits, and the exceedance quotients.

Benzene, 1,1-dichloroethene (1,1-DCE), vinyl chloride, and benzo(a)pyrene were selected as the COPCs for quantitative evaluation. Benzene (1.50 µg/l vs. 0.36 µg/l RBC), 1,1-DCE (4.9 µg/l vs. 0.044 µg/l RBC), and vinyl chloride (0.33 µg/l vs. 0.019 µg/l RBC) were all detected from monitoring well 2D-MW2. Benzene also exceeded RBCs (0.86 µg/l vs. 0.36 µg/l RBC) in the sample collected from monitoring well 2D-MW3. Benzo(a)pyrene 0.07 µg/l vs. 0.0092 µg/l RBC) was detected in 2D-MW1.

A quantitative risk assessment was conducted for the four organic compounds selected as COPCs. Exposure to groundwater was quantitatively evaluated for potential exposure to a residential user and a construction worker. All of the cumulative noncancer hazards (0.06 for residential child, 0.3 for residential adult, and 0.07 for construction worker) and cumulative cancer risks (4.5E-05 for lifetime resident and 7.8E-07 for construction worker) were below USEPA's recommended levels. Therefore, the groundwater at SWMU 2D does not appear to pose an unacceptable risk to human health.

Ecological Risk Assessment

As agreed to in the new administrative procedure, conducting all clean-up activities following the procedural and substantive requirements of CERCLA while the RCRA Consent Order remains in effect, the Navy conducted an ERA at all NAS Oceana SWMUs to identify the ecological concerns and processes to be followed at each SWMU. Where potential complete exposure pathways do not exist (such as the case where all contamination has been removed or where the site is covered by concrete) an ecological risk assessment, beyond a site conceptual model, will not be recommended.

Contaminated soils at SWMU 2D are capped by concrete and asphalt. The area of groundwater contamination under the tarmac is not migrating. Habitat on the site includes impervious surfaces and grass.

There is no pathway for contamination to reach the ecological receptors at this SWMU because the soils are covered and there are no surface water resources on the site. Therefore, based on the SERA performed at SWMU 2D, no further action is recommended.

Conclusions and Recommendations

Although the four organic chemicals detected in groundwater (benzene, 1,1-dichloroethene (1,1-DCE), vinyl chloride, and benzo(a)pyrene) exceeded the EPA Region III RBCs for tap water they did not exceed the MCLs or Virginia Groundwater Standards. These chemicals were identified as COPCs in the human health risk assessment. Exposure to groundwater was quantitatively evaluated for potential exposure to the residential user. Under the residential exposure scenario, all of the non-cancer hazards and cancer risks were within EPA's recommended levels.

The 1,1-DCE contamination identified in the groundwater at SWMU 2D still exists, however, a review of the historical data and the Phase III analytical results shows that the 1,1-DCE concentrations are decreasing. Based on the results of the Phase II and Phase III RFI, the extent of 1,1-DCE groundwater contamination at this SWMU is limited to the vicinity of 2D-MW2. Trace concentrations of benzene were also detected at monitoring wells 2D-MW2 and 2D-MW3. The source of the 1,1-DCE, benzo(a)pyrene, and petroleum contamination has not been identified, but the contamination does not appear to be migrating off site.

The assessment of risk information as related to both human health and the environment is detailed in the preceding sections for SWMU 2D. These sections provide the investigation summary information and rationale to determine that SWMU 2D poses no unacceptable risk to human health or the environment. Therefore, no action is necessary at this SWMU because of the non-exceedances of MCLs and Virginia Groundwater Standards, the non-

cancer hazards and cancer risks below EPA's recommended levels, the low levels of contamination, the decreasing contaminant concentrations over time, and the lack of plume migration.

2.7.2 SWMU 18 — Hazardous Waste Storage Area, Building 200

An evaluation of risk to human health was conducted as part of the Phase III RFI. The SWMU as a whole also was evaluated for ecological risk. Results are summarized below.

Human Health Risk Assessment

The maximum detected concentrations in groundwater were compared to EPA Region III RBCs for tap water to determine COPCs. The comparison revealed no exceedances of the tap water RBCs or MCLs in the groundwater sample collected at SWMU 18 during the Phase III RFI. The soil maximum detected concentrations were compared to the EPA Region III RBCs for the ingestion of soil by the residential receptor. The comparison revealed no exceedances of the RBCs in any of the subsurface soil samples collected at SWMU 18 during the Phase III RFI. The Phase III RFI concluded that neither the soil nor the groundwater at SWMU 18 pose an unacceptable risk to human health. Therefore, no further action was recommended.

Currently, the soil at SWMU 18 that contains concentrations greater than 100 mg/Kg of TPH is covered by concrete. The human health risk assessment conducted during the Phase III RFI indicated that even if there was potential exposure to this soil in the future, there would be no unacceptable human health risk.

Ecological Risk Assessment

As agreed to in the new administrative procedure, conducting all clean-up activities following the procedural and substantive requirements of CERCLA while the RCRA Consent Order remains in effect, the Navy conducted an ERA at all NAS Oceana SWMUs to identify the ecological concerns and processes to be followed at each SWMU. Where potential complete exposure pathways do not exist (such as the case where all contamination has been removed or where the site is covered by concrete) an ecological risk assessment, beyond a site conceptual model, will not be recommended.

The habitat at SWMU 18 consists of parking lot and lawn. Contaminated soils at SWMU 18 were excavated, the surface was capped, and there are no surface water resources on the site; therefore, the SERA concluded that there is no pathway for contamination to reach the ecological receptors at this SWMU. Based on the SERA performed at SWMU 18, no further action is recommended.

Conclusions and Recommendations

The assessment of risk information as related to both human health and the environment is detailed in the preceding sections for SWMU 18. These sections provide the investigation summary information and rationale to determine that SWMU 18 poses no unacceptable risk to human health or the environment. Therefore, no action further action is necessary.

2.7.3 SWMU 19 — Waste Oil Storage Area, Building 541

An evaluation of risk to human health was conducted as part of the Phase I RFI and the POL CMS. The SWMU as a whole also was evaluated for ecological risk. Results are summarized below.

Human Health Risk Assessment

The Phase I RFI soil sampling results at SWMU 19 were compared to carcinogenic and noncarcinogenic RBCs for residential soil and no exceedances were detected. However, the TPH detections in soil exceeded the VDEQ underground storage tank regulatory standard for TPH of 100 mg/Kg. No federal standards or risk based concentrations exist for TPH. The results of the confirmatory sampling conducted during the POL CMS soil removal action indicated that soil with TPH greater than 100 mg/Kg had been removed and the soil at SWMU 19 poses no unacceptable risk to human health. Therefore, no further action was recommended.

Ecological Risk Assessment

As agreed to in the new administrative procedure, conducting all clean-up activities following the procedural and substantive requirements of CERCLA while the RCRA Consent Order remains in effect, the Navy conducted an ERA at all NAS Oceana SWMUs to identify the ecological concerns and processes to be followed at each SWMU. Where potential complete exposure pathways do not exist (such as the case where all contamination has been removed or where the site is covered by concrete) an ecological risk assessment, beyond a site conceptual model, will not be recommended.

Contaminated soils at SWMU 19 were excavated, the area backfilled, and there are no surface water resources on the site; therefore, the SERA concluded that there is no pathway for contamination to reach the ecological receptors at this SWMU. Based on the SERA performed at SWMU 19, no further action is recommended.

Conclusions and Recommendations

The assessment of risk information as related to both human health and the environment is detailed in the preceding sections for SWMU 19. These sections provide the investigation summary information and rationale to determine that SWMU 19 poses no unacceptable risk to human health or the environment. Therefore, no action further action is necessary.

2.7.4 SWMU 20 — Waste Oil Storage Area, Building 543

An evaluation of risk to human health was conducted as part of the Phase I RFI and the POL CMS. SWMU 20 as a whole also was evaluated for ecological risk. Results are summarized below.

Human Health Risk Assessment

The Phase I RFI soil sampling results for SWMU 20 were compared to carcinogenic and noncarcinogenic RBCs for residential soil and no exceedances were detected. However, the initial TPH detections in soil exceeded the VDEQ storage tank guidance notification standard of 100 mg/Kg of TPH. No federal standards or risk based concentrations exist for TPH. The results of the confirmatory sampling conducted during the POL CMS soil removal

action indicated that soil with TPH greater than 100 mg/Kg had been removed and the soils at SWMU 20 pose no unacceptable risk to human health. Groundwater was sampled in the area with the greatest soil contamination and analyzed for TPH, VOCs, PAHs, and metals. All detections were below MCLs and tap water RBCs so no further action for groundwater was required based on human health considerations. Therefore, no further action was recommended.

Ecological Risk Assessment

As agreed to in the new administrative procedure, conducting all clean-up activities following the procedural and substantive requirements of CERCLA while the RCRA Consent Order remains in effect, the Navy conducted an ERA at all NAS Oceana SWMUs to identify the ecological concerns and processes to be followed at each SWMU. Where potential complete exposure pathways do not exist (such as the case where all contamination has been removed or where the site is covered by concrete) an ecological risk assessment, beyond a site conceptual model, will not be recommended.

Contaminated soils at SWMU 20 were excavated, the area backfilled, and there are no surface water resources on the site; therefore, the SERA concluded that there is no pathway for contamination to reach the ecological receptors at this SWMU. Based on the SERA performed at SWMU 20, no further action is recommended.

Conclusions and Recommendations

The assessment of risk information as related to both human health and the environment is detailed in the preceding sections for SWMU 20. These sections provide the investigation summary information and rationale to determine that SWMU 20 poses no unacceptable risk to human health or the environment. Therefore, no action further action is necessary.

2.7.5 SWMU 23 — Bowser, Building 830

An evaluation of risk to human health was conducted as part of the Phase I RFI. The SWMU as a whole also was evaluated for ecological risk. Results are summarized below.

Human Health Risk Assessment

The Phase I RFI concluded that soil contamination beneath the asphalt at SWMU 23 was not significant enough to warrant a soil removal action or additional characterization and it poses no unacceptable risk to human health. The TPH detections were below the VDEQ storage tank guidance notification standard of 100 mg/Kg. The average of the two detections (42 mg/Kg) was below the VDEQ standards for clean fill of 50 mg/Kg. Arsenic was the only heavy metal that exceeded an RBC (residential but not industrial), however the maximum detected concentration of arsenic was below the mean soil concentration for the eastern United States (Shacklette and Boerngen, 1984). Specifically, the maximum concentration of arsenic (1.2 ppm) is less than the industrial RBC (3.8 ppm) and the mean soil concentration for the eastern United States (4.8 ppm), but greater than the residential RBC (0.43 ppm). Considering the detected concentration of arsenic relative to regional background concentrations, no further action was recommended.

Ecological Risk Assessment

As agreed to in the new administrative procedure, conducting all clean-up activities following the procedural and substantive requirements of CERCLA while the RCRA Consent Order remains in effect, the Navy conducted an ERA at all NAS Oceana SWMUs to identify the ecological concerns and processes to be followed at each SWMU. Where potential complete exposure pathways do not exist (such as the case where all contamination has been removed or where the site is covered by concrete) an ecological risk assessment, beyond a site conceptual model, will not be recommended.

At SWMU 23, soil sampling indicated that contamination under the asphalt is not significant enough to warrant a soil removal action or further investigation. In addition, there are no surface water resources on the site; therefore, the SERA concluded that there is no pathway for contamination to reach the ecological receptors at this SWMU. Based upon the SERA performed at SWMU 23, no further action is recommended.

Conclusions and Recommendations

The assessment of risk information as related to both human health and the environment is detailed in the preceding sections for SWMU 23. These sections provide the investigation summary information and rationale to determine that SWMU 23 poses no unacceptable risk to human health or the environment. Therefore, no action further action is necessary.

2.8 Selected Remedy

Previous investigations of SWMUs 2D, 18, 19, 20, and 23 have determined that these sites pose no unacceptable human health or ecological risk. Therefore, no CERCLA remedial action is necessary to protect public health or the environment.

2.9 Documentation of Significant Changes

The PRAP for NAS Oceana SWMUs 2D, 18, 19, 20, and 23 was released for public comment on January 7, 2001. The PRAP identified the No Action alternative as the Preferred Alternative. The Navy, EPA, and VDEQ reviewed all written and verbal comments submitted during the public comment period. As no public comments were received, no significant changes to the Preferred Alternative, as identified in the PRAP, are necessary or appropriate.

Table 2-1
Monitoring Well Sampling Results
Summary of Detected Chemicals that Exceed Screening Levels
Oceana Naval Air Station - Site 2D

Chemical	Screening Level and Regulatory Standard (µg/l) [1,7]		Frequency of Exceedance [2]	Location of Exceedance [3]	Analytical Result (µg/l)	DV Qualifier [4]	Detection Limit (µg/l) [5]	Exceedance Quotient [6]
1,1-Dichloroethene	0.044	RBCTap	1/5	MW2	4.90		1	111
	7	MCL	1/5	MW2	4.90		1	0.7
	NL	VaGW	1/5	MW2	4.90		1	NA
Benzene	0.36	RBCTap	2/5	MW2	1.50		1	4.17
	5	MCL	2/5	MW2	1.50		1	0.3
	NL	VaGW	2/5	MW2	1.50		1	NA
	0.36	RBCTap	2/5	MW3	0.86	J	1	2.4
	5	MCL	2/5	MW3	0.86	J	1	0.2
	NL	VaGW	2/5	MW3	0.86	J	1	NA
Vinyl chloride	0.019	RBCTap	1/5	MW2	0.33	J	1	17
	2	MCL	1/5	MW2	0.33	J	1	0.2
	NL	VaGW	1/5	MW2	0.33	J	1	NA
Benzo(a)pyrene	0.0092	RBCTap	1/5	MW1	0.07		0.05	7.5

Footnotes:

[1] - Groundwater analytical results were compared to the USEPA Region III Tap Water RBCs, the Virginia Groundwater Quality Standards, and the USEPA MCLs.

[2] - Frequency of exceedance = the number of samples with concentrations that exceed the screening level / the number of samples collected and analyzed for the chemical.

[3] - A "P" at the end of a sample designation indicates a duplicate sample.

[4] - "J" = Compound present - reported value is an estimate and may not be accurate.

[5] - Detection limit reported by the laboratory.

[6] - Exceedance Quotient = Analytical result / screening level.

[7] - NL = Not Listed

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Figure 2-1
Base Location Map
NAS Oceana, Virginia Beach, Virginia

CH2M HILL

00571 F B14

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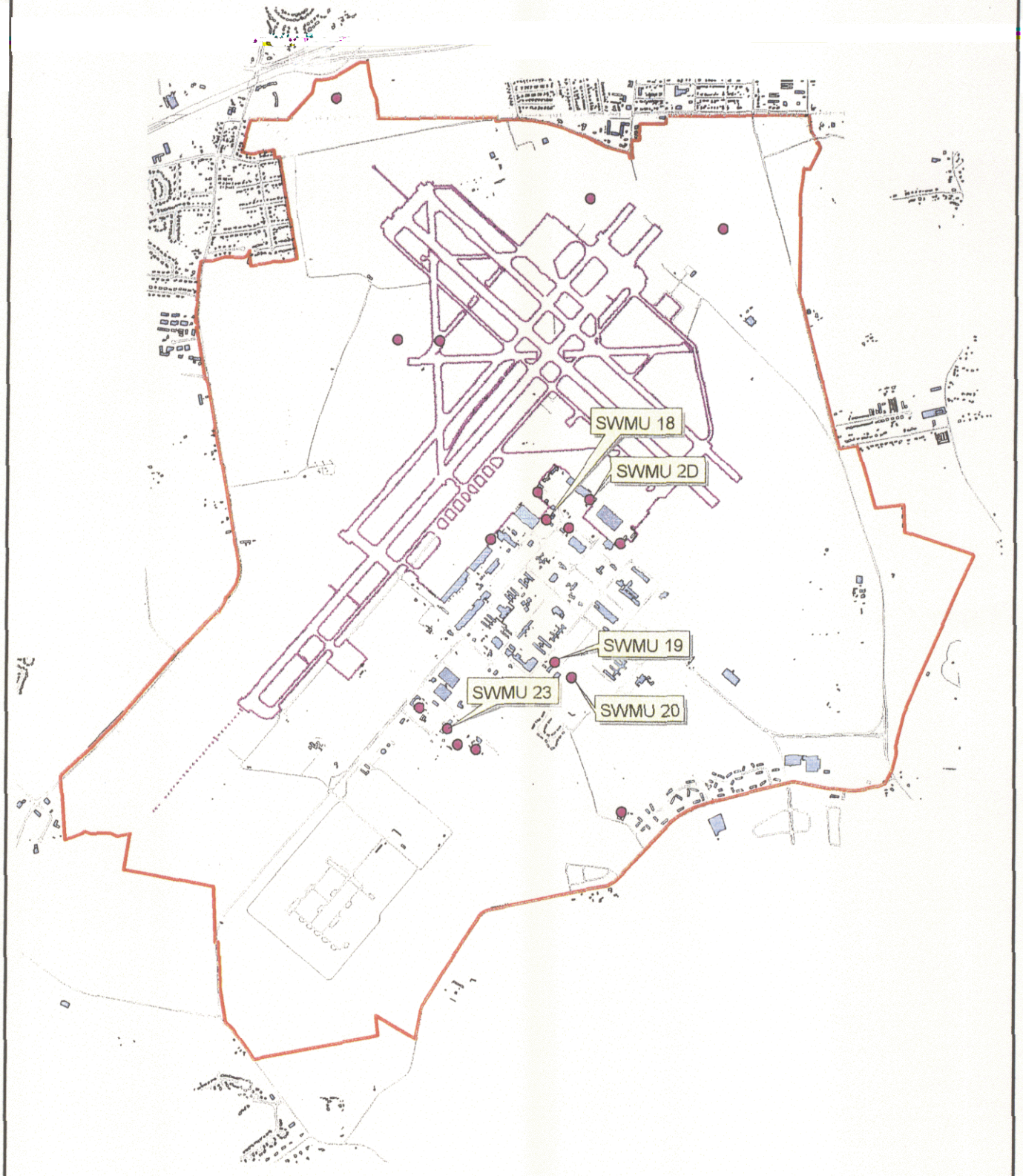

0 2000 4000 6000 Feet

Figure 2-2
SWMU Locations
NAS Oceana, Virginia Beach, Virginia

CH2M HILL

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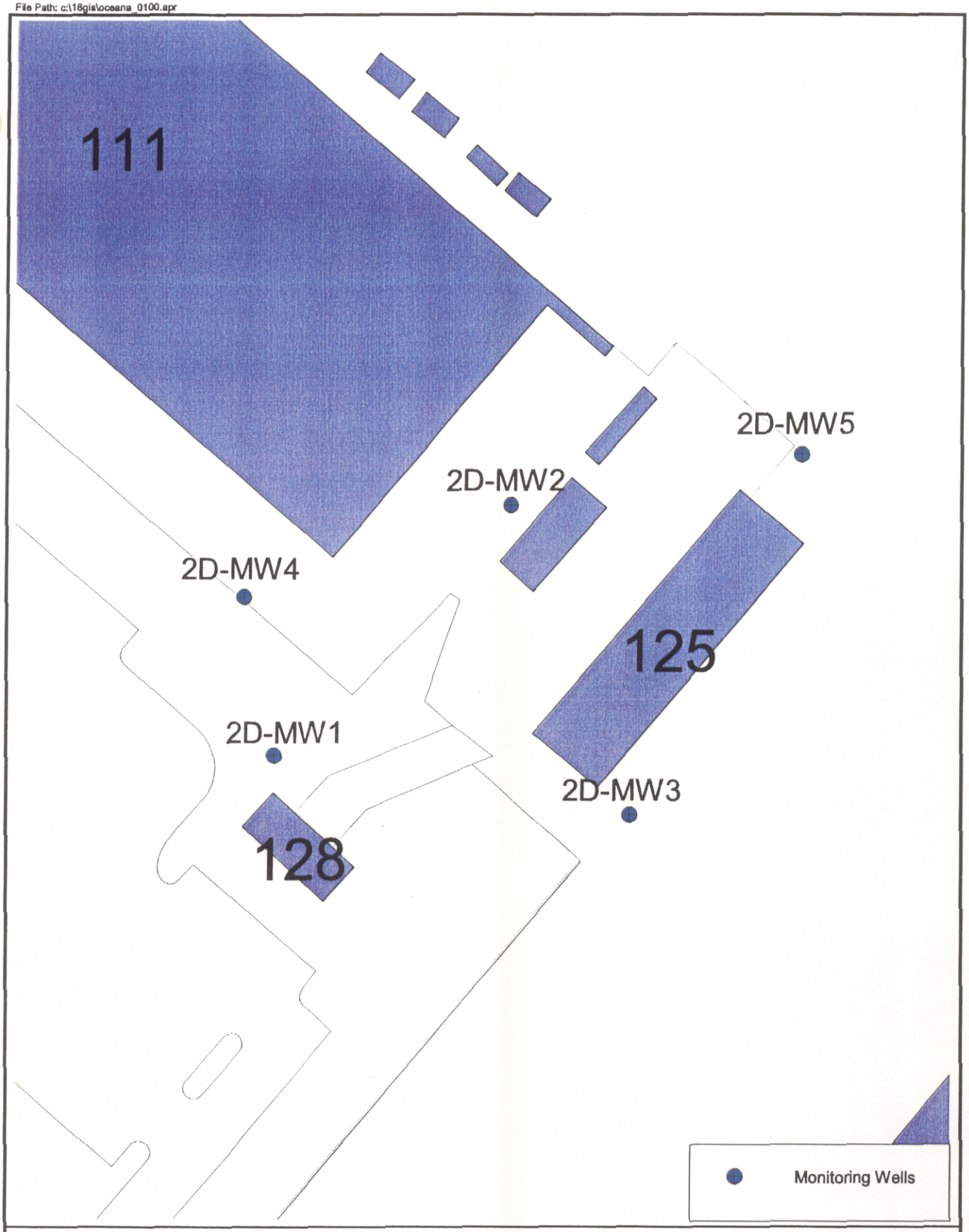

Figure 2-3
SWMU 2D
NAS Oceana, Virginia Beach, Virginia

CH2M HILL

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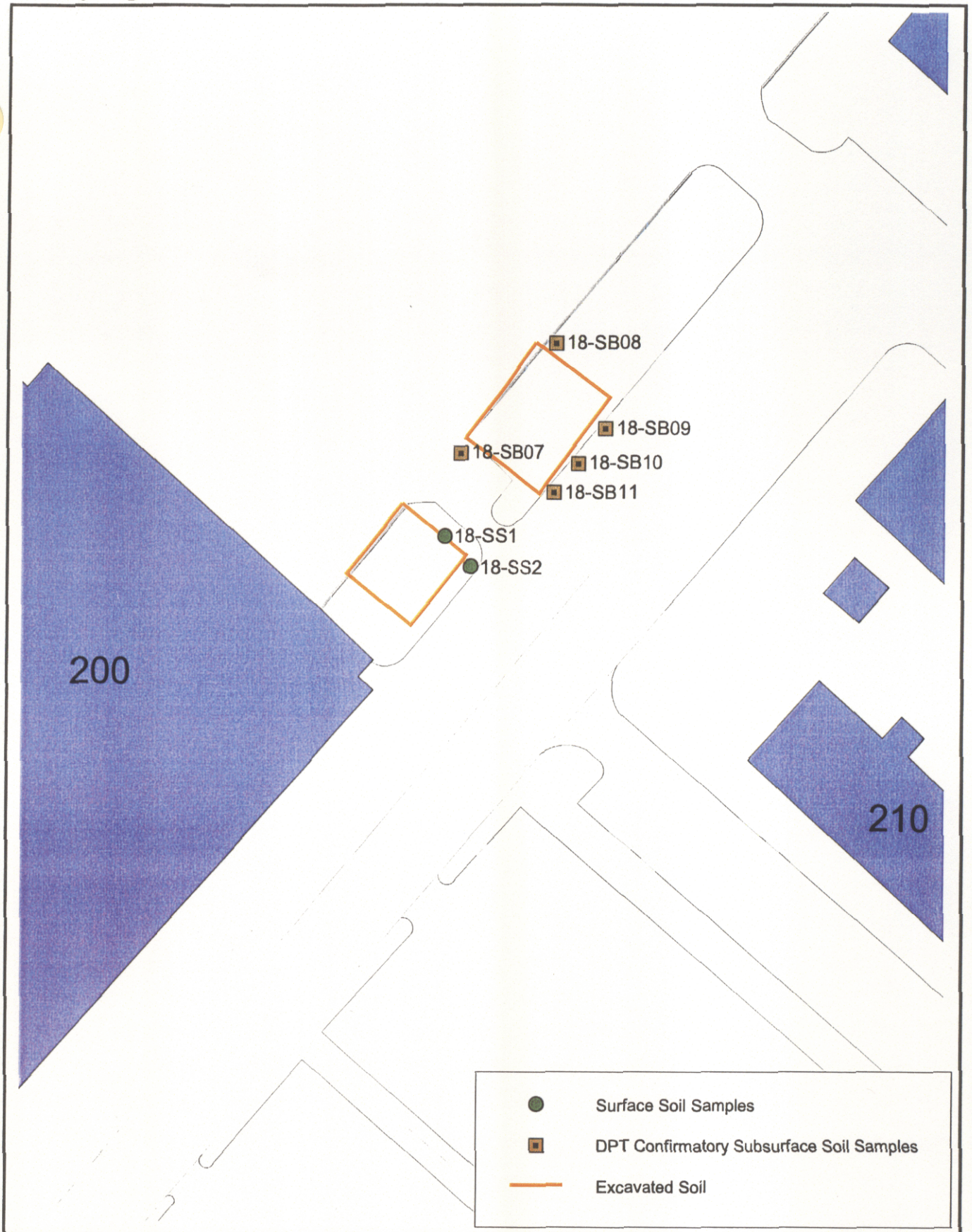

Figure 2-4
SWMU 18
NAS Oceana, Virginia Beach, Virginia

CH2M HILL

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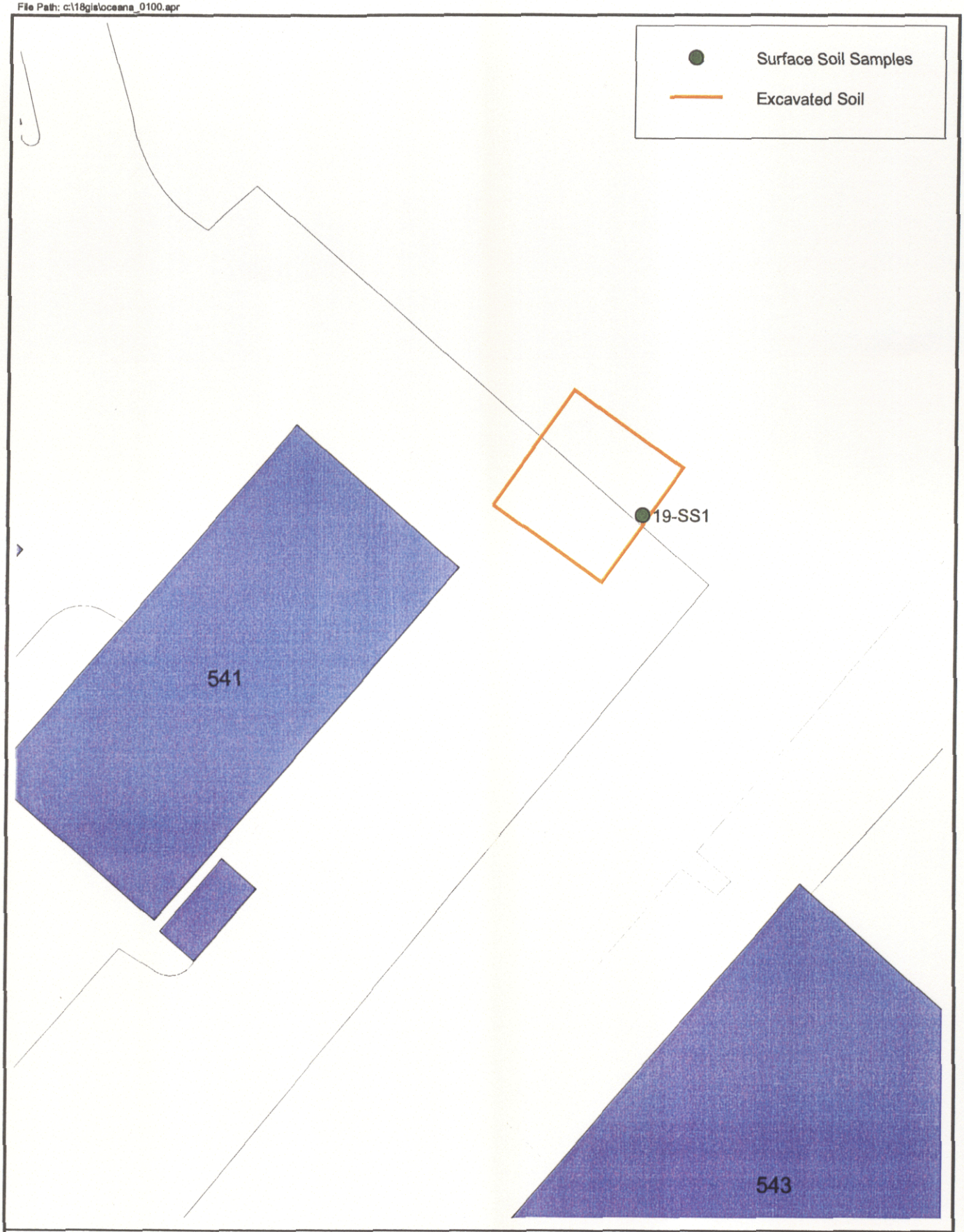

Figure 2-5
SWMU 19
NAS Oceana, Virginia Beach, Virginia

CH2M HILL

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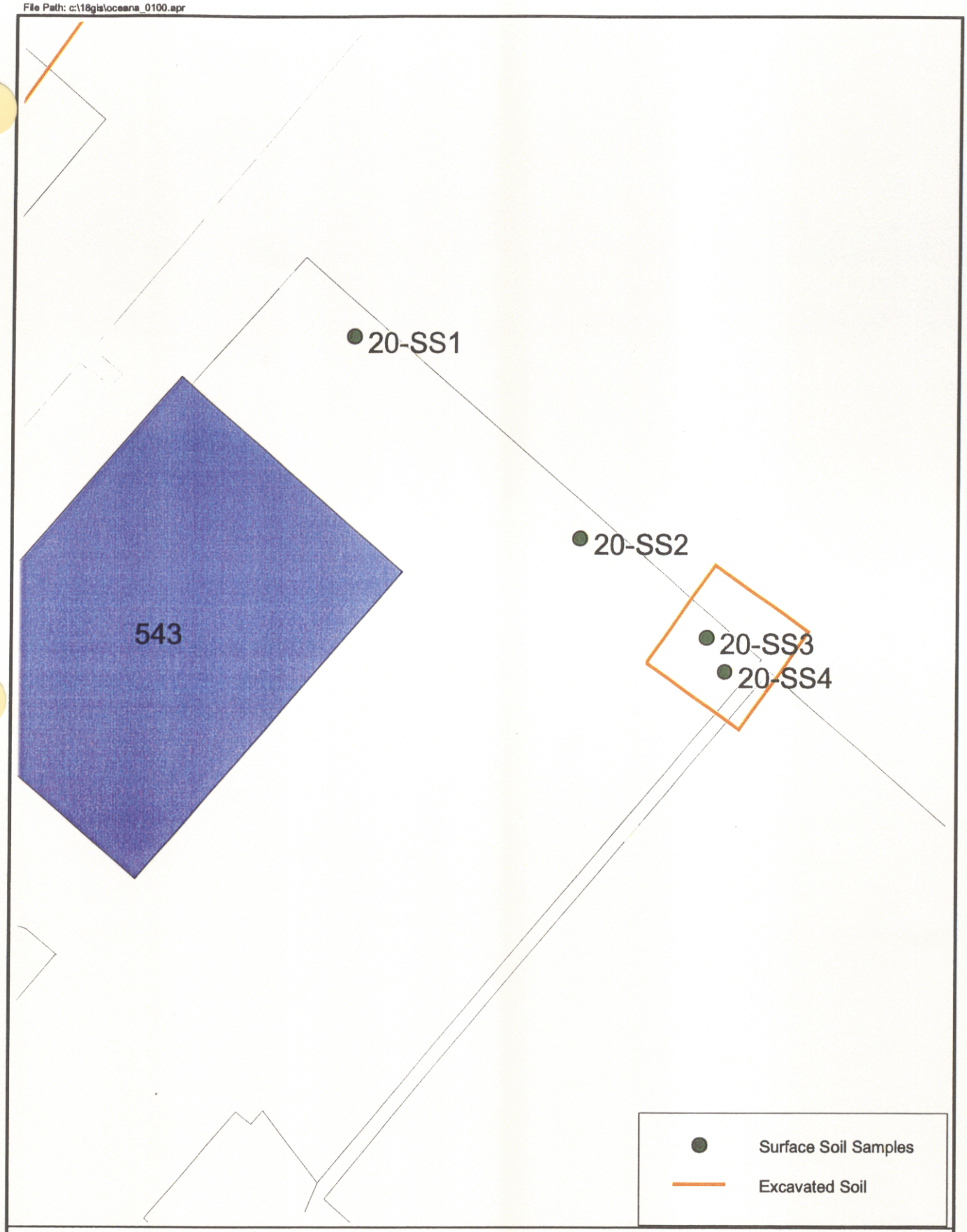

Figure 2-6
SWMU 20
NAS Oceana, Virginia Beach, Virginia

CH2M HILL

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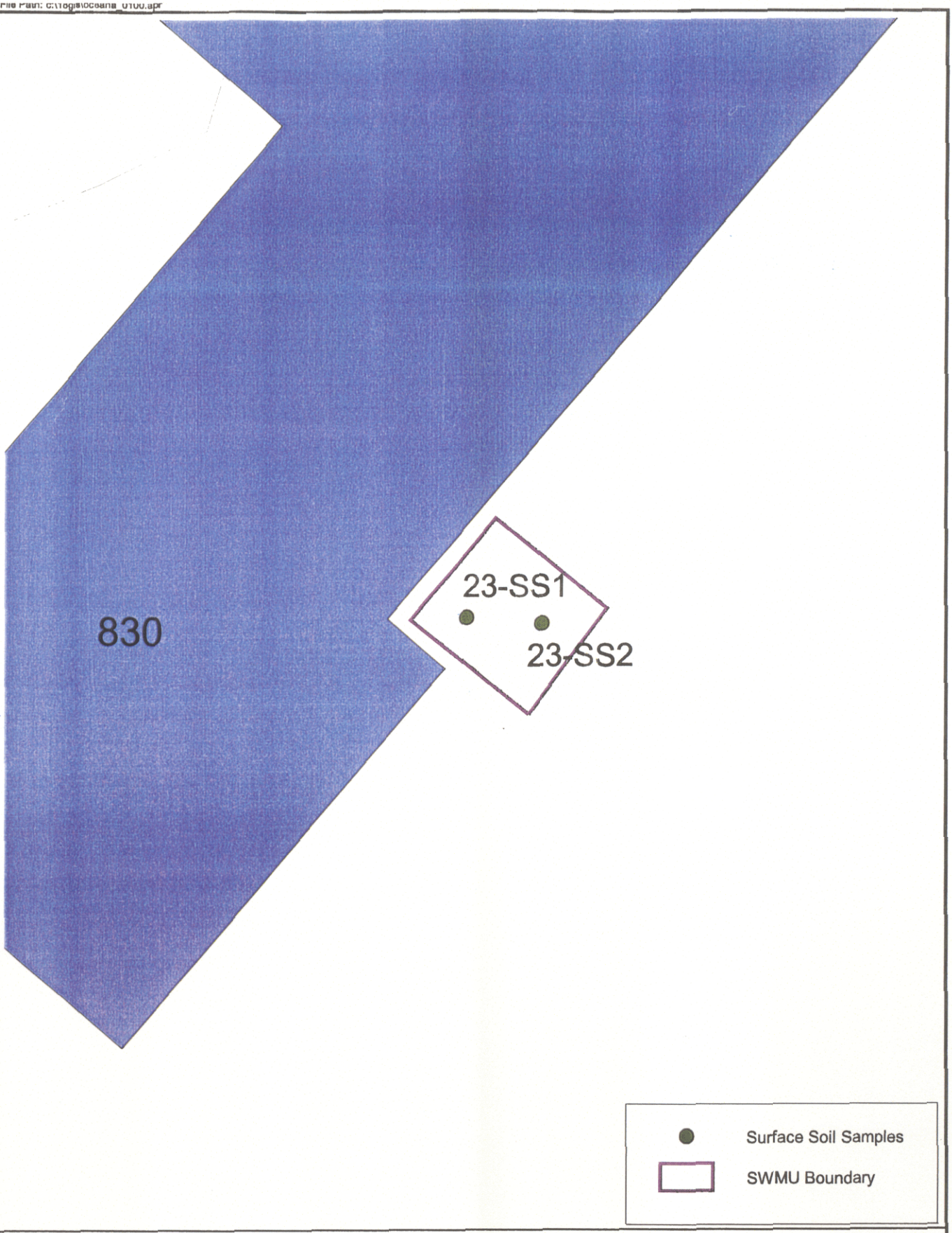

Figure 2-7
SWMU 23
NAS Oceana, Virginia Beach, Virginia

CH2M HILL

3.0 Responsiveness Summary

As required by CERCLA §117 and NCP §§300.430(f)(3)(i)(F) and 300.430(f)(5)(iii)(B), a public comment period, from January 7, 2001 to February 6, 2001, was conducted and a public meeting was held, on January 30, 2001, to present the PRAP and answer any questions on the PRAP or any of the other documents in the information repository. The only participants in the public meeting were representatives from the Navy, VDEQ, and EPA Region III. No written comments, concerns, or questions were received by the Navy, USEPA, or VDEQ during the public comment period or at the public meeting.

A copy of the certified transcript from the Public Meeting is included in Appendix B.

Appendix A
Virginia Concurrence Letter

COMMONWEALTH of VIRGINIA

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
http://www.deq.state.va.us

Dennis H. Treacy
Director

(804) 698-4000
1-800-592-5482

June 28, 2001

Mr. Abraham Ferdas, Division Director
Hazardous Site Cleanup Division (3HS00)
U.S. Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Re: Final Decision Document for Solid Waste Management Units (SWMUs) 2D, 18, 19, 20 and 23, Naval Air Station Oceana, Virginia Beach, Virginia

Dear Mr. Ferdas:

The Virginia Department of Environmental Quality (VDEQ) staff has reviewed the Final Decision Document (DD) for SWMUs 2D, 18, 19, 20, and 23. We concur with the selected remedial alternative as outlined in the DD dated June 2001.

Should you have any questions concerning this letter, please feel free to contact Stephen Mihalko at (804) 698-4202.

Sincerely,

Erica S. Dameron

Erica S. Dameron
Office Director
Remediation Programs

cc: Robert Stroud, RPM, EPA Region III
Karen J. Sismour, VDEQ
Milt Johnston, TRO-VDEQ
Leslie Romanchik, VDEQ

Appendix B
Certified Transcript of Public Meeting

CERTIFIED ORIGINAL

Draft Final

PROPOSED REMEDIAL ACTION PLAN

FOR SWMUs 2D, 18, 19, 20 and 23

NAS OCEANA

Virginia Beach, Virginia

January 30, 2001

TAYLOE ASSOCIATES, INC.

Registered Professional Reporters

Telephone: (757) 461-1984

Norfolk, Virginia

MR. REISCH: For the formalities, this is proposed plan public meeting for NAS Oceana, SWMUs 2D, 18, 19, 20, and 23. The Department of the Navy is issuing this proposed plan as part of its public participation responsibilities under Sections 113K and 117(a) of CERCLA, as amended, commonly known as the superfund program and the National Environmental Policy Act of 1969 (NEPA). This proposed plan focuses on SWMUs 2D, 18, 19, 20, and 23. Navy recommends no further action for these SWMUs based on risk to human health and the environment.

MR. BALLINGER: Any questions?

MR. MIHALKO: How long is the public comment period going to be open?

MR. REISCH: A 30-day public comment period which begins on January 7 and concludes on February 6. A copy of this document was sent to the information repository and was advertised in The Virginian-Pilot on January 7.

MR. BALLINGER: Amen.

MR. HARLOW: Note that there is no participation from the public.

MR. REISCH: We need to note who was in attendance.

MR. HARLOW: Jeff Harlow, Navy.

MR. MIHALKO: Steve Mihalko, Department of Environmental Quality, State of Virginia.

MR. BALLINGER: John Ballinger, Navy, region mid-Atlantic.

MR. STROUD: Bob Stroud, EPA Region 3.

MR. REISCH: Tim Reisch, Navy.

(The proceedings were concluded at 7:20.)

COURT REPORTER'S CERTIFICATE

I, Michelle Lee Stegall, RPR, certify that I recorded verbatim by stenotype the proceedings in the captioned cause in Virginia Beach, Virginia, on January 30, 2001.

I further certify that to the best of my knowledge and belief, the foregoing transcript constitutes a true and correct transcript of said proceedings.

Given under my hand this 30th day of January, 2001, at Norfolk, Virginia.

Michelle Lee Stegall, RPR